

PATENT SPECIFICATION

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COMPLETE SPECIFICATION.

Improved Flexible Shaft.

I, FRITZ PLETSCHER, of 19, Grendel, Luzern, Switzerland, a Swiss citizen, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

The present invention relates to a flexible shaft.

It has previously been proposed to form a flexible shaft by means of a spiral band. The flexible shaft of the present invention is formed like a spiral band and is an improvement on the known flexible shaft in as much as the separate helices of the band are adapted to engage with the helices on either side thereof by reason of steps or teeth on the edge of each helix, one face of each step or tooth lying parallel with the axis of the shaft.

Thus the force of torsion which is produced in this kind of shaft is transmitted directly from one helix of the band to another, without interfering with the flexibility of the shaft.

The serrations on the edges of the bands can be partially distorted, i.e. one serration may have curved flanks to engage within recesses having straight flanks on the adjacent helix or vice versa.

In order to transmit comparatively greater powers by the flexible shaft, it may be arranged in a way, that one or more shafts, as heretofore described can be connected together co-axially at their ends.

The invention is more particularly described with reference to the accompanying drawings, in which:—

Figs. 1 and 2 are views of a shaft for transferring power in one direction only, Fig. 2 being the end view of Fig. 1.

Figs. 3 and 4 show a flexible shaft for the transmission of power in both directions of rotation of the shaft.

Fig. 5 shows a modified form of construction of flexible shaft also utilised for the transmission of power in two directions.

Figs. 6 and 7 are sectional views of a number of shafts constructed according to this invention, Fig. 7 being an end sectional view corresponding to the side sectional view of Fig. 6.

The flexible shaft is formed of a metallic band wound into a number of helices 1, the edges of each helix being stepped as shown in Fig. 1, the steps comprising lateral or circumferential edges 2 and axial edges 3. It will thus be seen that each helix is capable of gearing with an adjacent helix on either side of the band in order to allow for the transmission of power by torsion regardless of the elasticity of the band. This transmission power of course, can only take place in one direction, that is in a clockwise direction looking from right to left of the band as otherwise if the band is rotated anti-clockwise looking in the same direction, adjacent helices will not engage to transmit the necessary power.

In the construction shown in Figs. 3 and 4 however, each helix is provided with teeth or serrations 4 adapted to engage within corresponding grooves 5 of the adjacent helix. By this means power is transmitted in either direction of rotation of the band. It will be noticed from this figure that the recesses 5 on each helix are situated opposite teeth 4 on the other edge of the helix so that no difficulty is met in effectively gearing each helix to its neighbours.

In the construction shown in Fig. 5, curved teeth 6 are provided on one edge of each helix and are adapted to engage within recesses 7, the three sides of which are substantially in the form of three sides of a parallelogram, whilst on the other edge of each helix teeth are formed as shown at 8 and these engage

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in recesses 9 formed between adjacent teeth on the corresponding opposite edge of the adjacent helix.

- In the construction shown in Figures 6 and 7 the flexible shaft is formed of three bands 10, 11 and 12, which are assembled according to any of the constructions shown in Figures 1-5. These shafts are mechanically coupled at both their ends by soldering or other suitable means so that each shaft is able to participate in the transmission of the necessary power.

- Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that I am aware of Patent No. 10,181 of 1893, and do not claim what is described and shown therein, but what I do claim is:—

1. A flexible shaft formed of a spiral band the edge of each helix of which is stepped or provided with teeth, one face of each tooth or step of which is parallel with the axis of the shaft, such edges being adapted to engage with edges of

steps or teeth on adjacent helices so that the rotation of one helix is imparted to the adjacent helices substantially as described.

2. A flexible shaft formed of a spiral band provided with side teeth in which the teeth of one edge of one helix are curved to engage between sides, parallel to the shaft axis, of teeth on the opposite edge of an adjacent helix substantially as described.

3. A flexible shaft as claimed in Claim 1 consisting of a number of bands formed of a number of helices, such bands being mechanically coupled together at their ends by soldering or the like means substantially as described.

4. A flexible shaft constructed and arranged to operate substantially as described with reference to the accompanying drawings.

Dated this 26th day of February, 1927.

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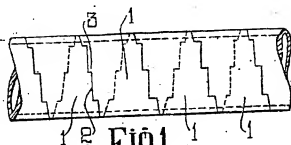


FIG. 1.



FIG. 2.

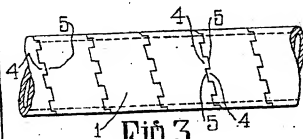


FIG. 3.



FIG. 4.

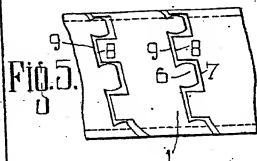


FIG. 5.

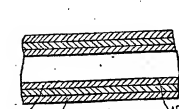


FIG. 6.



FIG. 7.

[This Drawing is a reproduction of the Original on a reduced scale.]

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